News In Health
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Getting Back in Action

Participation Is Key to Recovery

Stroke. Heart attack. Arthritis. Serious illness or injury often leads to a long, slow return to health. Thoughts of making a comeback take a backseat to simple survival. Recovery can also mean learning how to live with a disability. Researchers supported by NIH are studying the many roads people take to recovery. No matter where you've been, their findings may help you find your way back.

Whatever the condition, one of the most important keys to recovery is participation, says Karen Lohmann Siegel, a physical therapist at NIH's Clinical Center. "Many medical procedures and treatments are done to a patient by a health care provider, and the patient's role in the treatment is small," she explains. "That is not the case in **rehabilitation**. In rehab, the patients do a lot of the work themselves to get better."

Each year about 700,000 people in the U.S. have a stroke and 1.1 million suffer a heart attack. The moment you survive the critical stage of a **cardiovascular** illness or injury is when you start the recovery phase, says Dr. Michael Weinrich of NIH's National Institute of Child Health and Human Development (NICHD).

"We have good data that people who engage in moderate activity improve their cardiovascular system," Weinrich says. "That's particularly true for people who have a stroke."

Results from several studies stress the role of physical activity in rehabilitation. The good news is that it's possible to help people get enough exercise to improve their chances of recovery. Researchers supported by NIH's National Institute of Nursing Research, for example, have found that education and encouragement promoted exercise in a rehab program for people recovering from a heart attack or bypass surgery.

Physical activity speeds recovery in other areas, too. NICHD and NIH's National Institute of Neurological Disorders and Stroke are funding a 5-year **clinical study** on improving the **motor skills** of stroke survivors. Called EXCITE (Extremity Constraint Induced Therapy Evaluation), the study is looking at how well patients recover function in an arm disabled by stroke. For a period of time, the patient avoids using the healthy arm to perform daily tasks. Instead, the arm weakened by stroke does all the work. Results so far have shown that the forced activity strengthens the weak arm and helps the stroke survivor recover motor skills faster.

Joint replacement surgery is another condition for which physical activity speeds recovery. As people live longer and want to stay active, operations to replace worn-out knees and hips with artificial joints have become more common. Recovering from this type of surgery means learning to walk again. Not long after your surgery, doctors and nurses want you right back on your feet. A physical therapist will plan exercises to help you retrain your muscles and adjust to using the artificial joint.

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Definitions

Cardiovascular
The system of heart and vessels that circulates blood throughout the body.

Clinical study
A research study with human volunteers that aims to answer specific health questions.

Motor Skills
Skills that require muscle movements. They involve the brain, skeleton, joints and nervous system.

Rehabilitation
Exercise and other therapy designed to help you return to your normal activities after an illness or injury.

Inside News

Wise Choices
You're the Key Player in Your Recovery

Rehabilitation is a team effort with one goal: getting you back to where you want to be. NIH Clinical Center Physical Therapist Karen Lohmann Siegel offers the following tips on being a good team player:

- **Set meaningful goals.** Both long-term and short-term goals are important. "Short-term goals are things you should reasonably be able to do in 1 to 2 weeks," Siegel explains. They are the building blocks to get you to your ultimate long-term goals, and may be revised many times over the course of rehab.
- **Communicate with your rehab team.** Often there's more than one way to achieve results. If one exercise is not working for you, let your team know. They may be able to recommend another approach.
- **Know your value to the team.** Be an active participant in your own recovery. In rehab, it ***is*** all about you!

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You'll probably feel some pain, but the movement will help you recover more quickly.

People who've had injury to their nervous system after disorders like stroke want to regain more than just basic movements. They want to get back to moving the way they did before they became sick. Scientists are now testing the idea that damaged muscles may recover better and faster with help from technology. NIH-funded researchers at Arizona State University have recently designed a lightweight robotic device called RUPERT (for Robotic Upper Extremity Repetitive Therapy) that helps stroke survivors regain some basic activity in their arms.

Dr. Jiping He, ASU professor of bioengineering and RUPERT research team leader, explains that the device has an advanced control system that detects the wearer's intent to move. It can help them do the things we often take for granted, like reaching for a cup, eating or moving something from one place to another.

RUPERT is being developed by Kinetic Muscles, Inc., the same company that helped ASU produce a similar device for recovering hand function called the Hand Mentor. Power for these devices is supplied by "pneumatic muscles," small instruments that use compressed air to mimic muscle movements.

Research teams funded by NICHD and NIH's National Institute of Biomedical Imaging and Bioengineering (NIBIB) began testing the Hand Mentor last year in stroke survivors. Dr. He says RUPERT should be ready in a year or so to start testing in patients. Preliminary work is also under way for leg rehab devices.

Another interesting development in rehabilitation research is an innovative movement analysis lab at NIH's Clinical Center. Specialized video cameras record the movements of reflective markers attached to the patient's feet, legs and hips. Sensors go on the patient's skin to record leg muscle activity. Special plates built into the lab's floor measure the forces exerted by the patient's body on the floor. Once all the signals are collected by computer, the rehab team uses that information to get a very detailed idea of how the person's joints and muscles move. They can then design a tailored recovery plan for each patient's unique situation.

"People are complex organisms—we adapt," Weinrich says. "We still don't know what optimal rehabilitation is, but we are learning."

Surviving the initial phase of illness was your first success. Playing a major role in your recovery plan and adding some physical activity to your daily routine will help speed you along the way. ■

Definitions

Nervous System
System that receives and interprets sensations (like touches, sounds, and sights), and coordinates activities (like muscle movements) throughout the body.

Heart Disease:
www.nhlbi.nih.gov/health/public/heart/other/your_guide/living_well.htm
301-592-8573
240-629-3255 (TTY)

Hip Replacement:
www.niams.nih.gov/hi/topics/hip/hiprepqa.htm

Joint Replacement Surgery:
www.niams.nih.gov/hi/topics/arthritis/jointrep.htm

Post-Stroke Rehabilitation:
www.ninds.nih.gov/disorders/stroke/poststrokerehab.htm

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Listen Up!

Coping With Hearing and Speech Problems

Did you know that almost 42 million Americans suffer from a communication disorder—a problem with their speech, voice, language or hearing? That number includes people in all stages of life, but those most likely to be affected are the most vulnerable in our society: older adults and the very young. May is Better Hearing and Speech Month, and NIH's National Institute on Deafness and Other Communication Disorders (NIDCD) wants you to know that you can do something about communication disorders.

Each year, approximately 2 or 3 out of every 1,000 babies born in the U.S. have a detectable hearing loss, a problem that can affect their speech, language, social and intellectual development. Hearing loss increases with age, too; almost half of those 75 years old or older have hearing loss.

Early detection of hearing loss in newborns is especially critical. Results from NIDCD-funded research show that if children with hearing loss are identified by 6 months of age and receive help early, they can make bigger strides in developing language skills than children whose hearing loss is identified later.

Treatment for hearing loss may include hearing aids or **cochlear implants**. Adults and children who are deaf and hard-of-hearing can also learn to communicate using American Sign Language or cued speech, a system that uses hand shapes along with natural mouth movements to represent speech sounds.

If you think you are losing your hearing, see an audiologist, a professional who can measure your hearing, or an otolaryngologist, a doctor who specializes in diseases of the ear, nose and throat, to have your hearing checked.

People can also have difficulty speaking, problems with their voice or trouble understanding and using language. One language disorder called aphasia is often the result of a stroke that damages portions of the brain. Speech and language disorders such as this can make it difficult to succeed in school or work, and can cause social problems as well.

The good news is that most people with speech and language problems can be helped. A speech-language pathologist is a health professional trained to evaluate and treat people with voice, speech and language disorders. A speech-language pathologist can help you improve or regain your capacity to speak and understand language.

Even if the problem can't be eliminated, people with language and speech problems can learn communication strategies that help them cope better and achieve a better quality of life. ■

www.nidcd.nih.gov/health

Definitions

Cochlear Implant
A small electronic device that can provide a sense of sound to a person who is profoundly deaf or severely hard of hearing. Hearing aids amplify sound, but cochlear implants make up for damaged or non-working parts of the inner ear.

Wise Choices

Signs of Possible Hearing Loss:

- Do you have a problem hearing on the telephone?
- Do you have trouble following a conversation when two or more people are talking at the same time?
- Do people complain that you turn the TV, radio or stereo volume up too high?
- Do you have to strain to understand conversation?
- Do you have trouble hearing when there's a lot of noise in the background?
- Do you find yourself asking others to repeat themselves?
- Do many people seem to mumble or not speak clearly?
- Do you misunderstand what others are saying and respond inappropriately?
- Do you have trouble understanding the speech of women and children?
- Do people get annoyed because you misunderstand what they say?

If you answered "yes" to three or more of these questions, talk to your doctor about getting a hearing evaluation.

Health Capsules

Low-Calorie Diet May Slow Aging

There's been a lot of buzz on the web about using a low-calorie diet to live longer. The technique works in creatures from fruit flies to rats, mice and monkeys, but no one knows if it can do the same for people. A new study of overweight people who cut their calories by 25% for 6 months found some promising lab results that have been linked to longevity. The results aren't enough for any major conclusions, but they point the way toward longer studies to see if low-calorie diets can really slow the aging process in people.

NIH-funded researchers at Louisiana State University studied 48 healthy men and women who did not have active lifestyles. They were randomly divided into 4 groups:

- One group stayed on a diet to maintain their pre-study weight.
- A calorie-restriction group ate 25% less calories.
- A calorie-restriction with exercise group ate 12.5% less calories but exercised to burn 12.5% more.
- A very low-calorie diet group ate 890 calories a day until they lost 15% of their weight. They then followed a weight-maintenance diet to hold the lower weight.

By the end of 6 months, there were changes in 2 important measures that have been linked to longer lives in humans. Fasting insulin levels were significantly lower in all 3 groups on the restricted-calorie diets. Core body temperature was reduced in both the calorie-restriction and calorie-restriction with exercise groups. The low-calorie diets may also affect some other measurements of metabolism that have been linked with living longer and aging.

This study was a small pilot project for a long-term study called the Comprehensive Assessment of Long-Term Effects of Reducing Intake of Energy (CALERIE). CALERIE, which is sponsored by NIH's National Institute on Aging (NIA), will test the effects of lowering caloric intake for 2 years in a larger number of people. It's set to start later this year. ■

www.nia.nih.gov/HealthInformation/Publications/AgingUndertheMicroscope/chapter04.htm

Definitions

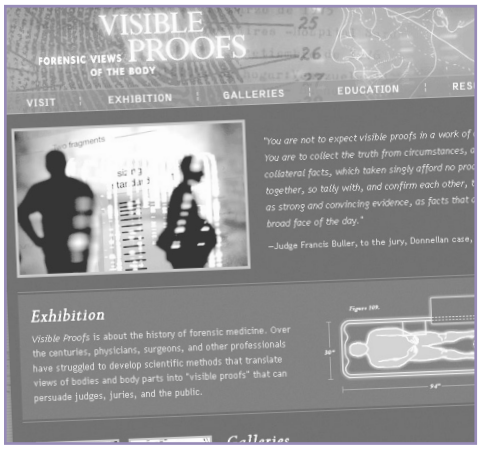
Calorie
A measure of the energy stored in food. When you eat more calories than your body can use, it stores that extra energy as fat.

Placebo
A look-alike substitute with no active ingredients. Used to compare how well an experimental treatment works.

Featured Web Site
Visible Proofs

www.nlm.nih.gov/exhibition/visibleproofs/

Visible Proofs traces the history of forensic medicine—the efforts of physicians, surgeons and other specialists to translate views of bodies and body parts into hard evidence or "visible proofs" that testify on behalf of the victims of violent crime. The site includes online galleries, activities and lesson plans.
From NIH's National Library of Medicine.



Progress Toward Avian Flu Vaccine

Avian flu viruses from a class called H5N1 have now infected birds throughout Southeast Asia and are spreading into Central Asia, Africa and Europe. They've infected some people, too. So far, the viruses can't move easily from person to person, but if they learned how it could cause a global outbreak. Results from a new study funded by NIH show that researchers may be on the path to develop a vaccine to protect people.

The vaccine they tested was made from an H5N1 virus that was changed so it can't infect people. Researchers assigned 451 healthy adults between 18 and 64 years old at random to 5 groups. Each received 2 shots about a month apart of either a placebo or 1 of 4 different doses of the vaccine. Their blood was collected and tested to see what amounts of the virus-fighting molecules called antibodies their bodies had made.

The higher the dose of vaccine, the more antibodies people produced. Of those in the highest-dose group, a bit more than half produced levels of antibody that the researchers predict would neutralize the virus. Almost all the side effects were mild.

Although some hoped that the vaccine might work better than it did, these results are still a step in the right direction, according to Dr. Anthony S. Fauci, director of NIH's National Institute of Allergy and Infectious Diseases. Researchers are now testing several ways to make a more effective H5N1 vaccine, including adding immune boosters known as adjuvants to try to stimulate better antibody production. ■

www3.niaid.nih.gov/news/focuson/flu/default.htm